LOWER WILLAMETTE GROUP

Chair: Bob Wyatt, NW Natural
Treasurer: Fred Wolf, Legacy Site Services for Arkema

June 30, 2008

Chip Humphrey
Eric Blischke
US Environmental Protection Agency, Region 10
805 SW Broadway, Suite 500
Portland, OR 97205

Re: Portland Harbor Superfund Site; Administrative Order on Consent for Remedial Investigation and Feasibility Study; Docket No. CERCLA-10-2001-0240. Toxicity Reference Value Methodology – Aquatic Biota Tissue

Dear Messrs. Humphrey and Blischke:

On June 13, you provided the LWG with EPA's methodology for derivation of aquatic biota tissue TRVs. We appreciate the level of effort that went into its creation and commend the overall quality of the work; thank you. We have identified several issues that we wish to discuss with you. The purpose of this letter is to summarize those issues.

1. The aquatic biota tissue TRV methodology stipulates that the SSD approach will be used $n > 5$ (n = number of species with acceptable tissue TRVs), with the "lowest value approach" to be used if $n < 5$. EPA has done a good job of summarizing the uncertainties associated with using the SSD approach versus the lowest value approach. As a default assumption, $n = 5$ is a reasonable threshold for applying the SSD approach. However, the proposed methodology in general, and the $n = 5$ threshold in particular, is untested. Therefore, LWG reserves the right to critically evaluate the SSD methodology in light of the particular datasets to which it is being applied (e.g., taking into account factors such as taxonomic diversity, species representation in the TRV dataset, TRV outliers and knowledge of relative species sensitivity).

2. EPA proposes to use fish egg and other fish data as equivalent. This is inconsistent with the use of whole body fish data to characterize exposure. Niimi (1983) reported that maternal adults have order of magnitude higher mercury tissue concentrations than their eggs, while for PCBs and OCPs including DDTs, maternal adult concentrations are a factor of 2 to 4 higher than their eggs. Inclusion of egg data in TRV derivation does not account for maternal-egg transfer and would result in overly conservative TRVs. It may be acceptable on a chemical-specific basis to model maternal adult concentrations from egg data. Otherwise, egg data should not be used in tissue TRV development.

3. The aquatic biota tissue TRV methodology calls for applying a default acute-chronic ratio (ACR) of 8.3 (Raimondo et al. 2007) to mortality (survival) LOERs:

"LOER residues for mortality will be divided by an uncertainty factor of 8.3 (Raimondo et al. 2007) to convert lethal residues to residues where lethality is indistinguishable from acceptable control mortality, then weighted equally with the growth and reproduction LOERs, without application of any other uncertainty factors. Use of this default uncertainty factor will be used for all survival LOERs unless sufficient data exist to estimate chemical specific acute-chronic ratios."

Page 10 of the aquatic biota tissue TRV methodology explains that the purpose of the ACR is to convert the LRx concentration to an "LRLOW" value, expected to be an LR<1-10 that should results in little or no toxicity to the test species. The Raimondo et al. paper indicates that the ACR of 8.3 represents the ratio of the LC50 to either the MATC (geometric mean of a no effects concentration and a lowest effects concentration) or the no effects concentration. In light of the stated objective for applying the ACR, and considering the data from which that ACR was derived, the methodology should be clarified by stating that the default ACR should be applied to LC50s (rather than to all mortality LOERs) unless sufficient data exist to estimate chemical-specific ACRs.

4. The aquatic biota tissue TRV methodology does not discuss how to deal with multiple LOERs reported for a given species in a single paper. When calculating species mean values, all data should be extracted from each of the studies. However, it may be appropriate to exclude shorter exposure duration results when longer exposure duration results are also presented.

5. The aquatic biota tissue TRV methodology stipulates using only fish data when $n > 5$, but to incorporate aquatic invertebrate data when $n < 5$. The LWG does not believe that sample size should be a factor in determining whether aquatic invertebrate data are included or excluded. We recommend making a determination based on consideration of the specific tissue residue datasets available as to whether invertebrate TRVs should be considered representative of fish, regardless of n.

6. Metals are among the substances to which EPA intends to apply the aquatic biota tissue TRV methodology. The LWG has doubts about the appropriateness of using tissue residue TRVs for metals, for reasons that are articulated in EPA's recent Framework for Metals Risk Assessment (USEPA 2007, Section 5.3.4, pp. 5-17 – 5-19). Further evaluation of this issue is necessary, but the LWG is willing to consider the available tissue residue TRV datasets and evaluate tissue residue TRVs for metals on a case-by-case basis.

7. The aquatic biota tissue TRV methodology stipulates that individual literature citations must report information on a minimum of two exposure concentrations or doses: one control and at least one contaminant exposure. The LWG agrees with this data acceptability criterion. However, the methodology also states that control group data aren't an "absolute requirement," which seems to contradict the data acceptability criterion. The LWG requests an explanation of when and why EPA would consider a study without a control group – and by extension a non-statistically significant LOER – to be acceptable.

The LWG shares EPA's desired outcome for the aquatic biota tissue TRV derivation process: to develop TRVs that are based on measured tissue residues from various aquatic species that are associated with adverse ecological effects or unacceptable ecological risks to the assessment endpoints for various categories of ecological receptors at Portland Harbor. We look forward to finalizing a set of tissue residue TRVs that serve this purpose.

Sincerely,

Bob Wyatt
Chairman, Lower Willamette Group

cc: Confederated Tribes and Bands of the Yakama Nation
Confederated Tribes of the Grand Ronde Community of Oregon
Confederated Tribes of Siletz Indians of Oregon
Confederated Tribes of the Umatilla Indian Reservation
Confederated Tribes of the Warm Springs Reservation of Oregon
Nez Perce Tribe
Oregon Department of Fish & Wildlife
United States Fish & Wildlife
Oregon Department of Environmental Quality
LWG Legal
LWG Repository